Geophysical Research Abstracts, Vol. 7, 02088, 2005
SRef-ID: 1607-7962/gra/EGU05-A-02088

The Aptian - Albian cold snap: Evidence for "mid" Cretaceous icehouse interludes

J. Mutterlose, A. Bornemann

Institut fuer Geologie, Mineralogie und Geophysik, Ruhr-Universitaet Bochum
(joerg.mutterlose@rub.de)

Variations in calcareous nannofossil assemblages from both low and high paleolatitudes of the late Aptian - early Albian suggest a global cooling. Significant shifts include a decline of Tethyan taxa and a subsequent expansion of high latitudinal species. The cooling is supported by sedimentological observations (glendonites, ice rafted debris) and stable isotope data. The first phase of decreasing surface water temperatures is indicated by a marked decline of Tethyan nannoconids in the late Aptian at both high and low latitudinal sites. This is paralleled by an increase of the cool water nannofossil species Crucibiscutum salebrosum and a biogeographic expansion of the high latitudinal nannofossil taxon Repagulum parvidentatum. The biogeographic expansion of the two high latitudinal nannofossil cold water belts is followed by the first common occurrence of diatoms in the high latitudes. The second phase is characterized by the onset of siliceous phytoplankton. Since the siliceous phytoplankton occurs simultaneously both in the high latitudes of the northern and southern hemisphere, a global climatic cooling signal seems likely. A possible explanation asks for an enhanced formation of cold deep water in the high latitudes, caused by a strengthening of the latitudinal temperature gradients. Since an equatorial Atlantic seaway did not yet exist, deepwater flow may have used alternative seaways via the Tethys. Our findings suggest a much more complex climatic history of the 30 Ma lasting Aptian - Turonian greenhouse period than previously thought. This period was obviously punctured by at least one icehouse interlude in the late Aptian - early Albian interval.